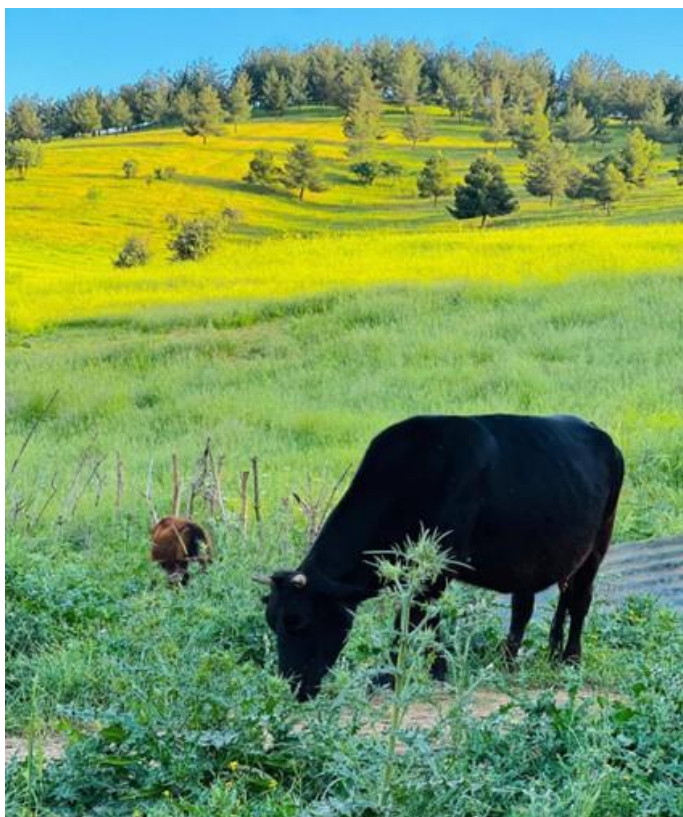


Iraq Dairy Sector Scanning



Produced for:

**Consulate General of the
Kingdom of the Netherlands
Erbil, Kurdistan Region, Iraq**

November 2024

Executive summary

This report presents a scan of the dairy sector in Iraq. The project was commissioned by the Consulate General of the Kingdom of the Netherlands in Erbil to VetEffect. The document aims to identify potential opportunities for Dutch enterprises to participate in the local dairy industry towards a sustainable dairy sector. Because the dairy sector of Iraq is mostly concentrated in the Kurdistan Region of Iraq (KRI) due to the climatic conditions and prominent government and investment support, the study especially focuses on KRI.

The report starts with an exploration of the dairy sector's historical significance in the KRI, along with information to livestock populations, specifically cattle, sheep, and goats, dairy production, and import and export. It notes the lack of reliable dairy sector data, as a critical gap in the existing framework to foster investment and monitor growth and development.

Key Findings:

1. **Market Insights:** As of 2023, the Iraqi dairy market is valued at approximately USD 1.4 billion, with projections indicating a compound annual growth rate (CAGR) of 6.33%, potentially reaching around USD 5.819 billion by 2029. This demand is primarily driven by a young population and a growing preference for domestically produced dairy products such as milk, cheese, and yogurt. The dairy market in Iraq opens up more than USD 4 billion in investment opportunities, particularly in areas such as cattle breeding farms, plant management, and logistics.
2. **Production Challenges:** At present, local dairy production fulfils only around 10% of the demand for fresh milk. Key challenges identified include a heavy reliance on imports, water scarcity, insufficient infrastructure, and limited access to advanced agricultural technologies. The report suggests there is considerable room for enhancing local feed production and veterinary services.
3. **Animal Health and Welfare:** Examination of current situation relating to animal health and welfare reveals an urgent need for enhanced veterinary health services and veterinary education within the region. Recent advancements in animal welfare laws indicate positive progress in this domain.
4. **Sustainability Considerations:** Environmental challenges such as water scarcity, climate change, and soil degradation are increasingly significant. The report underscores the importance of adopting sustainable agricultural practices, including techniques for water conservation and soil management, to ensure the longevity of the sector and individual dairy projects. More nature-inclusive agricultural practices will be needed to restore and preserve the unique nature in KRI and Iraq, requiring dairy development practices to consider soil degradation, and prevent water and soil pollution, as well as preserve biodiversity. Agroecology, and nature-inclusive farming are approaches that need to be considered in the development of new sustainable business models for profitable dairy farming.
5. **Opportunities for Collaboration:** The report identifies various opportunities for collaboration between Dutch companies and local dairy stakeholders, particularly in areas such as modern farm housing and equipment, husbandry and infrastructure, veterinary services, and genetic improvement of livestock. The application of efficient production methods and robust supply chain practices could substantially benefit the KRI dairy sector.

Conclusions and Recommendations:

The analysis indicates that, despite existing challenges, there is substantial potential for growth of the dairy sector in Iraq, in particular in the KRI. Dutch companies are encouraged to utilize their expertise in sustainable agricultural practices, veterinary care, and dairy technology to explore these emerging opportunities.

To promote the long-term viability of dairy production in the KRI, the report recommends:

- Implementing training programs for farmers to enhance knowledge in animal health, dairy production methodologies, and climate resilience of all aspects of the dairy value chain;
- Strengthening local feed production to diminish reliance on imports and enhance self-sufficiency, on condition of long term water availability;
- Investment in upgrading infrastructure related to milk collection and processing;
- Fostering public-private partnerships that could advance local dairy development initiatives.

Overall, the significant gap between local production capacity and import reliance presents a prime opportunity for international companies and investors to engage with KRI's dairy market, tapping into the unmet demand and enhancing productivity and sustainability. The dairy market in Iraq has been experiencing notable growth, driven by increasing consumer demand and evolving market dynamics.

The overarching goal is to develop a dynamic, sustainable dairy sector in Iraq that meets local consumption demands while adhering to international high quality standards, thereby creating economic opportunities for the community. Engagement from the Dutch dairy sector is positioned as a significant enabler of this transition, aiming for mutual benefits for local and international stakeholders alike.

Abbreviations

AI	Artificial Insemination
CAGR	compound annual growth rate
CBD	Convention on Biological Diversity
dunm	Donum (=1000 m ²)
FMD	Foot-and-mouth disease
GDP	Gross Domestic Product
KOARP	Kurdistan Organization for Animal Rights Protection
KRI	Kurdistan Region of Iraq
KRSO	Kurdistan Region Statistics Office
INIC	Iraqi National Investment Commission
IQD	Iraqi dinar (1 Iraqi Dinar equals 0,0007 Euro; date: Oct 2024)
LULC	Land Use Land Cover
MCC	milk collection centre
MoARW	Ministry of Agriculture and Water Resources (KRI)
MoP	Ministry of Planning
QBMPS	Quality-based milk payment scheme
RVO	Rijksdienst Voor Ondernemend Nederland
SME	Small Medium Enterprise
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WOAH	World Organisation for Animal Health

Disclaimer

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1. Introduction

This Iraq Dairy Sector Scanning report is prepared by VetEffect from the Netherlands, commissioned by the Consulate General of the Kingdom of the Netherlands, Erbil, Kurdistan Region, Iraq. Because the dairy sector of Iraq is mostly concentrated in the Kurdistan Region of Iraq (KRI) due to the climatic conditions and prominent government and investment support, the report will focus on the KRI, with reference to the whole of Iraq where relevant and explicitly mentioned. This report is a baseline sector analysis report, with the purpose to provide an overview of the dairy sector involving cattle, sheep and goats. It is therefore not a fully comprehensive report, containing details for every component, but it does include its current status, key players, and the government regulations; analyses and describes the structure, size, location and sustainability of the dairy sector in Iraq and dairy sector related import and export trends over the years, explores challenges and opportunities for Dutch companies in entering and operating within the Iraqi dairy market, and for collaboration and partnerships with local stakeholders; and provides recommendations for potential growth and investment. Its overall aim is to support Dutch business development in Iraq, to serve Iraqi and Dutch government, companies, institutions, and other stakeholders to strengthen sustainable dairy development.

The report was prepared according to the following methodology: first relevant information was collected on dairy and sustainable development of agriculture in Iraq. Data were collected using internet searches, and by collecting publications and reference reports from key stakeholders in the Netherlands and in Iraq. In addition, several interviews were conducted with selected Iraqi stakeholders¹. Subsequently the information was analysed and reported. Where possible, we used triangulation of data when no sole reliable data source existed.

2. Sector overview in numbers and maps

Sector

The dairy sector is historically important in Iraq and in particular in the KRI due to favourable local conditions. There is not yet an official identification and registration system for animals and farms in Iraq, and the national statistical office² does not provide accessible official statistical data specific for dairy sector in Iraq as a whole. For the KRI some information is available via the KRI governmental websites. According to data from FAO, the number of cattle (and buffaloes) in Iraq has increased from nearly 1,5 million animals in 2000 to 2,3 million animals in 2021. The number of sheep and goats in Iraq as a whole is relatively stable between 2010 and 2021, with 8 to 9 million animals (See Table 1). In KRI, the number of animals in 2022 was 256.999 cows, 3.112.876 sheep, and 1.231.949 goats (See Table 2). For Sulaymaniyah governorate it was reported that the human and livestock population have both grown over the past ten years : the human population increased by 30.5% between 2009 and 2018. The number of cattle increased by 9.73% only, while the number of sheep increased by 86.83%, mainly due to increase in consumption of lamb meat (Neimi and Hassan, 2020).

¹ Interviewees were from the Government: General Directorate of Animal Resources and Veterinary; from Salahaddin University: Dept of Animal Resources; from ZOM dairy processing company and from Halabja Group of Companies. Information sourced from interviews is referenced as ("Interviews")

² 2020 مقارنة بسنة 2021 المقارنة العام لقطاع الإنشاءات في القطاع العام لسنة 2021 مقارنته بسنة 2020. *الجهاز المركزي للإحصاء). Retrieved <https://cosit.gov.iq/ar/>

Figure 1 Dairy farm with Holstein-Friesian cattle in KRI and young stock



Courtesy: Consulate General of the Kingdom of the Netherlands, Erbil

Table 1 Number of cattle, sheep and goats in Iraq (x1000 heads)

Animal Type	2000	2005	2010	2015	2020	2021	2022
Cattle and buffaloes*	1.465	1.861	2.924	2.018	2.253	2.304	2.355
Sheep and goats	8.200	4.972	9.464	7.813	8.076	8.131	8.185
*No separate number for cattle is presented							
Source: FAO Country profile tool							
https://www.fao.org/statistics/country-profile-tool ; access 11 Nov 2024							

Table 2 Number of cattle, sheep and goats in KRI

Animal Type	Year	Number (KRI)
Cows	2021	324.125

	2022	256.999
	2023	315.335
Sheep	2021	3.509.888
	2022	3.112.876
	2023	2.760.866
Goats	2021	1.569.678
	2022	1.231.949
	2023	900.770
Source: Ministry of Agriculture & Water Resources\ General Directorate of Animal Wealth and Veterinary, Ministry of Planning https://krso.gov.krd/en/indicator ; access 11 Nov 2024		

Breeds and artificial insemination

The cattle population in Iraq is a mix of local breeds, international and cross breeds. Smallholders often use local breeds, whereas the commercial dairy farmers use cross breeds (Figure 2) or international breeds. Examples of international breeds are Friesian (Figure 1) and Simmental cattle (Ahmed, 2020; Interviews). The milk production per cow varies from about 20 l/day for Friesian (Figure 1) or Simmental breeds, 10-12 l/day for mixed (cross-) breeds, and 4-5 l/day for local cattle breeds (Interviews). The most important local cattle breeds are: Kurdi (Black cow, occurs throughout in KRI), Sharabi and Restaki typically in Duhok (Al-Jubori and Senkal, 2023; Interviews). The most important local sheep breeds are: Karadi (Kurdi breed, occurs in the whole of KRI), Hamdani (typically in Erbil and other parts of KRI), Awassi (occurs in the whole of KRI)(Figure 4) and Arabi. The most important local goat breeds are: Kurdi (Black goat, occurs overall in KRI but especially in Sulaymaniyah and Duhok), Shame, Maraz (cashmere goat; local breed with different coat colours, found mostly in mountainous regions of Sulaymaniyah, Duhok and Erbil) (Figure 3). Saanen goats have also been imported from the Netherlands (Figure 6).

Figure 2 Grazing crossbred cattle in Khalifan district, Erbil.



Courtesy: Consulate General of the Kingdom of the Netherlands, Erbil

Figure 3 Sheep and goat breeds Iraq



A, B Kurdi goat, C: Hamdani sheep, D: Magra sheep, E: Shame goat, F: Marza goat.

Courtesy: Prof. Dr. Yousif Al-Barzinji, Animal Breeding and Genetics, Salahaddin University-Erbil.

There are a few artificial insemination centres in Iraq, but not all are in operation in delivering semen to farmers (Interviews).

An often neglected element is the value of local breeds when developing the livestock sector. There is a trend of purchasing foreign animal breeds and semen, to increase as soon as possible milk and meat production. However, often foreign breeds need high quality feed, modern animal husbandry conditions and adequate preventive animal care to survive (such as prevention against endemic diseases, in particular blood parasites such as anaplasma and theileria). Extra burden is that they need to cope with unfamiliar climatic conditions such as extreme heat and humidity. There are many anecdotal experiences of imported animals dying shortly after arrival in a foreign farm, because they were unable to cope with the local circumstances. This risk is also present for Iraq and KRI. Local breeds are better adapted to the local circumstances, and their genetic value should be considered in a strategy for genetic improvement of cattle, sheep and goat populations, for a sustainable livestock production. As example, the local Awassi sheep breed is widely recognised for endurance to nutritional fluctuations, resistance to diseases and parasites, tolerance to extreme temperatures beside its high milk producing and growth abilities (Galal et al., 2008). This also is relevant for the local cattle breeds (Al-Jubori and Senkal, 2023).

Figure 4 Awassi sheep breed



Source: Galal et al., 2008

Farms and farm sizes (ha), location

In KRI, as well as in Iraq, most livestock is kept by smallholders. However, there is a considerable number of livestock production farms in the KRI (Table 3). There are approximately 5000 smallholders in KRI rearing cattle, sheep and goats. The commercial modern farm usually has more than 10 ha land and is located near the big cities usually, but the smallholders own no land, or small amounts of land of about 1 ha, and are located in the villages. Commercial farms mostly have their own land under contract, whereas smallholders typically herd their animals on community land, or by agreement, on land of other farmers.

There are no farmers associations for livestock in KRI. However, farmers associations do have an important role in many countries as representative body for the government, in policy development, investment plans and introduction of new laws and regulations affecting livestock production. At the international level the International Dairy Federation (IDF³), should be mentioned here. Iraq is not a member of the IDF, a federation of 39 member countries with big dairy sectors representing 74% of global milk production. This might be interesting to consider in the future.

³ <https://fil-idf.org/>

Table 3 Animal farming projects in KRI in 2023 (excluding small holder farms)

Animal farming projects	Nr**	Nr of animals*
Dairy farms - cattle	88	11.000
Goats and Sheep farming	77	22.000
Fattening young calf	103	68.000
Fattening goat	6	2.100
Buffalo farm	1	75
Source: Ministry of Agriculture & Water Resources\ General Directorate of Animal Wealth and Veterinary; *Interviews, estimates ** https://krso.gov.krd/en/indicator ; access 11 Nov 2024		

Land use

Most of the land in Iraq and KRI is owned by the government and is leased to farmers. There is no equivalent of a land registry law (Dutch: Kadaster) in Iraq nor KRI, as is common on most European countries, which records the ownership of land for the whole of the country, and that requires that owners of land are registered. However, there are areas where private land ownership exists. Land nearby cities is most expensive (Interviews). The Investment Authority and the Ministry of Agriculture have an important role in releasing land for agricultural production including dairy, and in general welcome animal investments in the region.

Approximately 1,2 million hectares is cultivated land in KRI, with cereals, grains and potato the major crops, with accompanying processing centres, and to a lesser extent other crops such as rice, legumes (chickpea, lentil), fodder crops (barley, corn, alfalfa), oil crops (olive, sunflower, soybean), vegetables (tomato, cucumber, onion) and fruits (grape, pomegranate, apple, peach)⁴. The land use for KRI is indicated in Table 4. See also the website of government for a very recent report (2023) on land use and land cover (LULC) classification for the KRI⁵.

Table 4 Land use and land cover (LULC) in KRI

LULC Classes	Year	Donum (=1000 m ²)
Urban	2023	350,267.7
Water Body	2023	155,507.6
Dense Forest	2023	1,271,812.8

⁴ for greater detail, see crop maps published by KRI's Ministry of Agriculture and Water Resources: <https://gov.krd/moawr-en/publications/planning/>

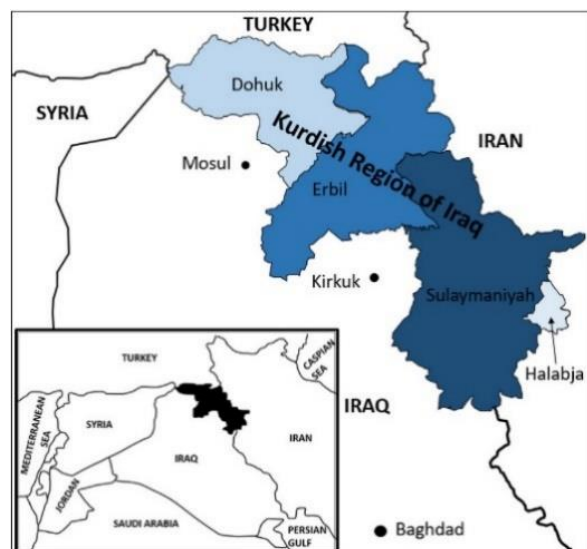
⁵ [https://krso.gov.krd/content/upload/1/root/krso-english-technical-report-12-12-2023-compressed-compressed-1\).pdf](https://krso.gov.krd/content/upload/1/root/krso-english-technical-report-12-12-2023-compressed-compressed-1).pdf)

Open Forests and Shrubland	2023	2,993,332.7
Irrigated land	2023	1,370,011.7
Rainfed	2023	424,042.2
Arable land (5 years)	2023	648,701.7
Arable land (10 years)	2023	4,513,351.0
Grassland	2023	5,341,629.8
Desertificated Land	2023	84,932.4
Rock Surface	2023	303,736.7
Uncultivated (Abandoned farmland)	2023	1,124,342.4
*Artificial forest area / dunm	2021	35,472
*Rainfed orchards area/dunm	2021	139,967
*Irrigated orchards area/ dunm	2021	121,597
Source: Kurdistan Region Statistics Office, *Ministry of Agriculture & Water Resources https://krso.gov.krd/en/indicator access 31 Oct 2024		

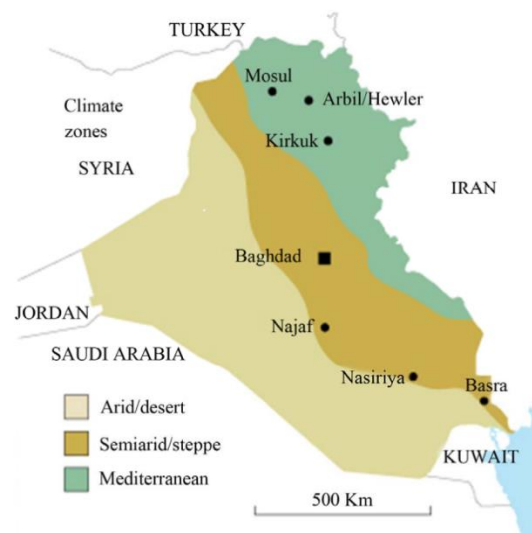
Geography and governorates

The Kurdistan Region of Iraq (KRI) consists of the four governorates Erbil (capital), Sulaymaniyah, Dohuk, and Halabja (See Figure 5). Quite different from the rest of Iraq, KRI is classified with a Mediterranean climate (Figure 5b). KRI is cooler and much wetter than the rest of Iraq and has five large perennial rivers. However, due to climate change and water disputes in the region scarcity of water is an increasing problem. This is an even larger issue in the rest of Iraq, which also faces salinity problems.

Figure 5 a) Kurdistan Region of Iraq (KRI) and governorates and b) Climate zones of Iraq



Source: DOI: [10.1016/j.trip.2019.100029](https://doi.org/10.1016/j.trip.2019.100029)



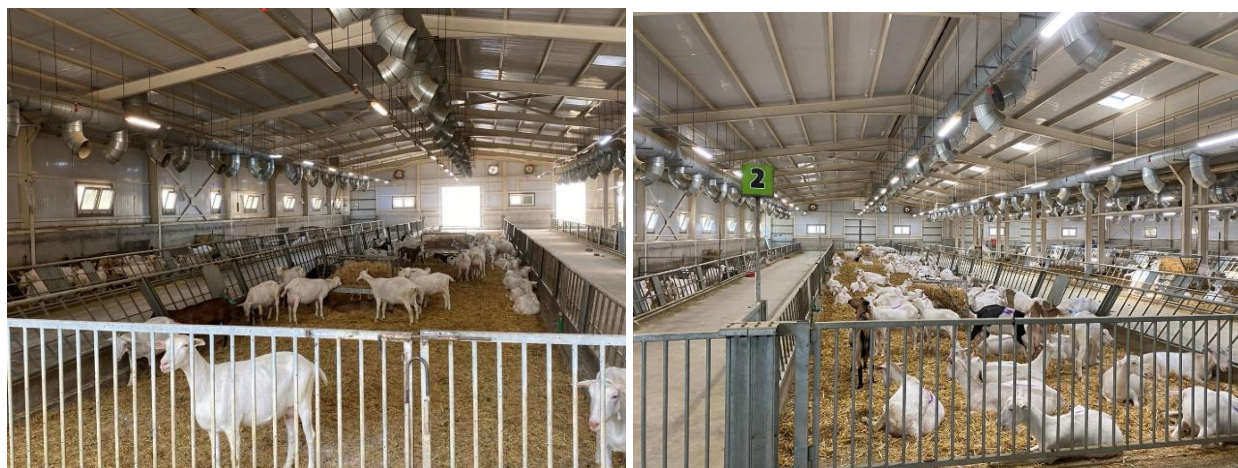
Source: www.scirp.org/pdf/ENG_2013080616381893.pdf

Brief descriptions of the governorates are as follows:

- Sulaymaniyah Governorate (incl Governorate Halabja): approximately 16 dairy farms, some with Friesian or Simmental cows; many small dairy factories, four larger ones; six feed factories for 90% dependent on imported ingredients; over 300 local wholesale and retail shops selling agricultural goods; access to veterinarians.
- Erbil Governorate: at least 36 dairy farms, most with local cows some with crossbreds and 2 planned large modern farms in Barzan region; 4 larger and many small dairy factories mainly using imported milk powder and 2 big factories under construction; 18 feed plants, depending for 70% of their produce on imported ingredients; over 300 companies trading agricultural goods.
- Duhok Governorate: approximately 14 dairy farms, only with local cows; one big meat cattle company; three larger and 65 small dairy factories mostly using imported powder milk; six feed plants depending for 90% of their production on imported ingredients; 65 veterinary clinics. In the past three years, a few large-scale modern farms have opened in Duhok. One of them is Rami Farm, which houses 1000 Dutch cows. In October 2024, another commercial project was launched (Kavin Farm) with capacity of 120.000 liter milk/day.⁶

⁶ <https://www.kurdistan24.net/en/story/805171> ; <https://kavin-group.com/project/51>

Figure 6 Rasan goat farm with Dutch imported Saanen goats



Courtesy: Consulate General of the Kingdom of the Netherlands, Erbil

3. Market size and key trends of milk products

Market Size and Growth

Due to lack of comprehensive official trade statistical databases specific for dairy sector in Iraq, FAOSTAT was used as key source of information with other complementary sources. Based on FAOSTAT data, the dairy production in volume increased from 1,65 million tonnes in 2000 to 2,23 million tonnes in 2022 (35,2% increase) (Table 5).

Table 5 Milk production in Iraq (million tonnes)

	2000	2005	2010	2015	2020	2021	2022
Milk production	1,65	1,74	1,72	2,18	2,19	2,19	2,23

Source: <https://www.fao.org/statistics/country-profile-tool>; access 31 October 2024

Domestic Demand

Per capita revenue in the dairy products and eggs market is projected to be USD 92.03 in 2024, indicating a steady demand for dairy products among the Iraqi population.⁷ UNDP is preparing a new report on the dairy value chain. This was not yet available during preparation of this report. Preliminary findings indicate that the required daily amount of raw milk in Iraq is 3,6 million litres/day, and about 90% of dairy demand is imported. An estimated 1% of the required milk is currently produced by local farmers.⁸

⁷ Statista. (2024). Dairy products & eggs - Iraq. Retrieved November 5, 2024, from <https://www.statista.com/outlook/cmo/food/dairy-products-eggs/iraq#revenue>

⁸ Personal communication Robert van den Heuvel; Sprout Economics

Market Data Registration and Key Trends in Dairy in KRI

The Kurdistan Region Statistics Office (KRSO)⁹, operating under the Ministry of Planning, maintains records across various socioeconomic areas, including population, labour force, education, health, price index, agriculture, environment, industry, construction, trade, transportation, communication, and Gross Domestic Product (GDP)⁴. While these records are extensive, they lack up-to-date, sector-specific data in English for the dairy industry, presenting a barrier to gaining accurate and current market insights (FAO, 2023; Regional Overview of Food Security¹⁰). Sector-specific data for the dairy market, including production rates and import dependencies, fall under the purview of the Ministry of Commerce, Ministry of Agriculture, and the Ministry of Planning, which are collectively responsible for overseeing data relevant to the dairy sector.

Based on available sources, the dairy market in the Kurdistan Region of Iraq (KRI) is currently valued at approximately USD 670 million, with a market size of around 558 million litres of milk (Interviews). This sector holds lucrative prospects for global players and investors due to post-war recovery, a growing population, and new economic reforms. The country's GDP and household disposable income are expected to grow at a CAGR of 6% between 2018 and 2025, indicating a positive trend for economic development.¹¹

Import and export of agricultural and dairy products and animals

Food exports (excluding fish) increased in value from 0,01 billion USD in 2000 to 0,18 billion USD, compared with 2000. Food imports (excluding fish) increased from 1,87 billion USD in 2000 to 12,56 billion USD in 2022. As a result, Iraq is a net importer of food. Dairy products are hardly exported, mostly imported. In 2022, dairy and eggs¹² at a value of 0,53 billion USD was imported in Iraq, equivalent to approximately 5% of the total food imports at a value of 10,32 billion USD, that composed of cereals and preparations (3,56 billion USD), fruits and vegetables (3,26), fats and oils (excluding butter)(1,54) and other food (1,43).¹³

Imports and exports of animals are presented below in numbers and value. Based on FAOSTAT data, trade in animals mainly consist of import of cattle. Overall, trade is fluctuating but an increasing trend can be observed, with approximately 125.000 imported cattle in 2022 (Table 6). In value, import of cattle mounted to approximately 122 million USD (Table 7).

⁹ Kurdistan Region [Statistics](#) Office

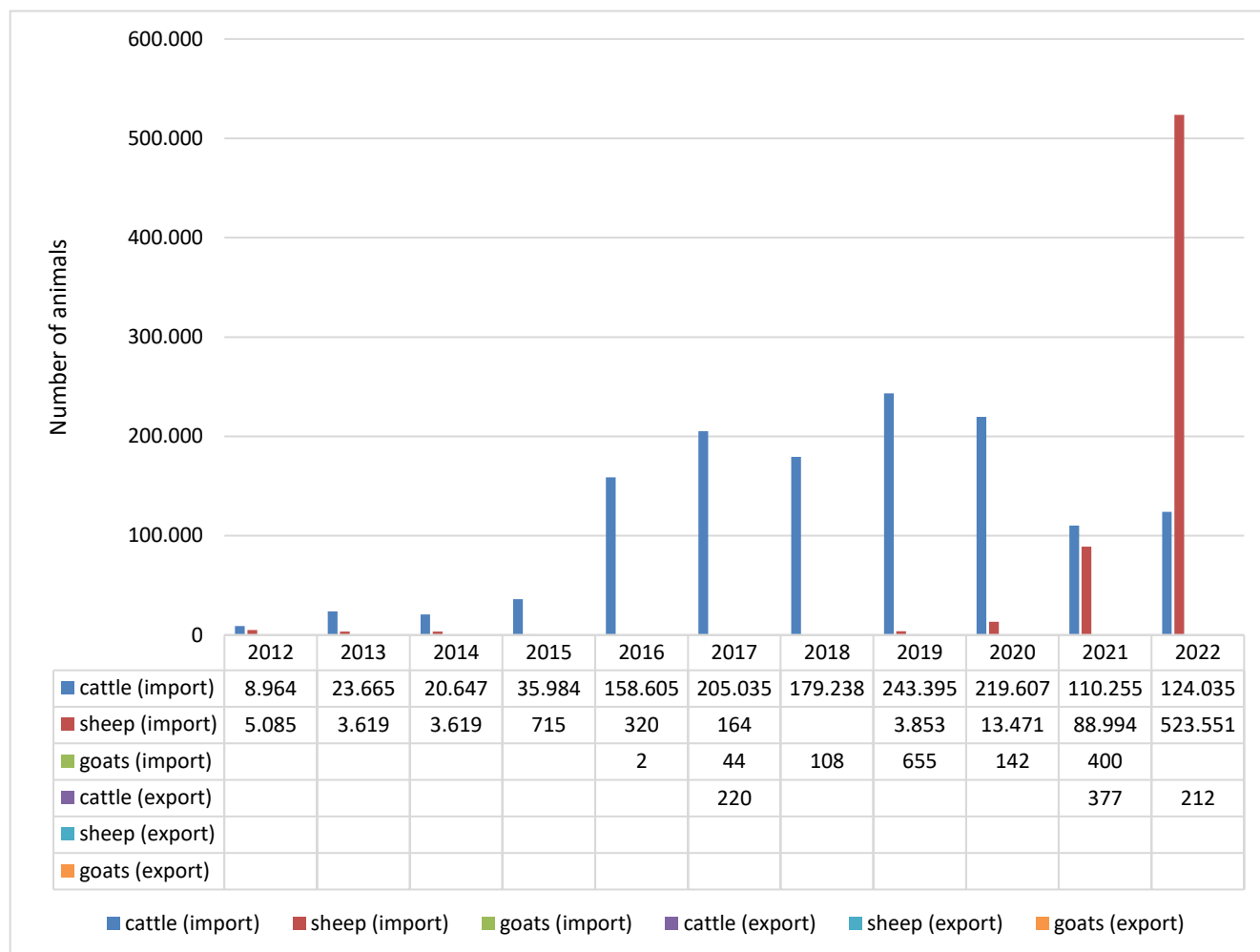
¹⁰ FAO, IFAD, UNICEF, WFP, WHO & UNESCWA. 2023. Near East and North Africa – Regional Overview of Food Security and Nutrition: Statistics and trends. Cairo. <https://doi.org/10.4060/cc8039en>

¹¹ Frost & Sullivan. (2018, September 26). Urbanisation, economic reforms and post war era drive growth opportunities for global players in Iraq's dairy market. Retrieved from Retrieved November 5, 2024 <https://www.frost.com/news/press-releases/urbanisation-economic-reforms-and-post-war-era-drive-growth-opportunities-global-players-iraqs-dairy-market/>)

¹² No separate figure for dairy presented

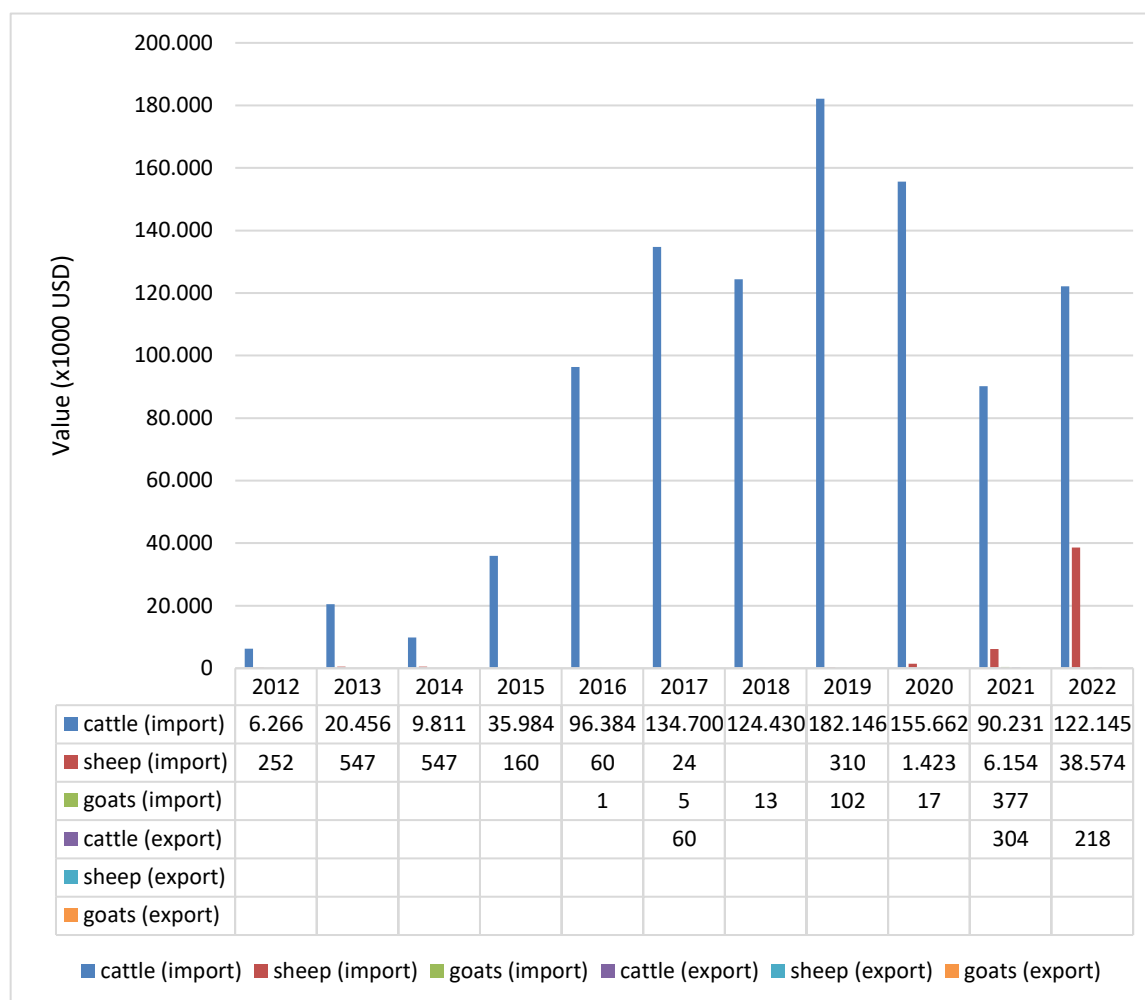
¹³ Food and Agriculture Organization of the United Nations. (2024). Statistics country profile tool. Retrieved October 31, 2023, from <https://www.fao.org/statistics/country-profile-tool4>

Table 6 Import and export of animals in animal numbers



Source: FAOSTAT; access 31 October 2024. FAO indicates that the data are based on estimated data using trading partners databases, estimated values and figures from international organizations. Caution is therefore advised when interpreting the data.

Table 7 Import and export of animals in value



Source: FAOSTAT; access 31 October 2024. FAO indicates that the data are based on estimated data using trading partners databases, estimated values and figures from international organizations. Caution is therefore advised when interpreting the data.

Key Trends

Several trends are shaping Iraq's dairy market:

- **Rising Consumer Demand:** There is an increasing preference for dairy products such as milk, cheese, and yogurt, contributing to market expansion.¹⁴
- **Economic Factors:** Fluctuations in oil revenues and economic conditions influence consumer purchasing power and, consequently, demand for dairy products.¹⁵
- **Supply Chain Challenges:** Issues such as water scarcity, inadequate infrastructure, and limited access to modern farming technologies affect domestic milk production and the overall dairy supply chain.

¹⁴ 6Wresearch. (2023). Iraq dairy products market (2024-2030): Analysis, industry, trends, forecast, outlook, value, revenue, share, companies, growth & size. Retrieved from <https://www.6wresearch.com/industry-report/iraq-dairy-products-market-2020-2026>

¹⁵ World Food Programme. (2022). Iraq market monitor report, issue no. 32, April 2022. Retrieved from <https://iraq.un.org/sites/default/files/2022-06/Iraq%20Market%20Monitor%20Report%20Issue32-%20Apr2022-Final.pdf>

- **Import Reliance:** Due to challenges in domestic production, Iraq relies significantly on dairy imports to meet consumer demand.

Self-Sufficiency Challenges and Opportunities

Iraq's dairy sector heavily depends on imports to meet domestic demand. In 2022, Iraq imported dairy products worth approximately USD 1.2 billion, with key imports including milk, cheese, and butter. This reliance on imports underscores the country's limited domestic dairy production capacity.

Additionally, Iraq imports significant quantities of dairy machinery and equipment, such as milking machines and processing equipment, to support its dairy industry. In 2022, imports of dairy machinery were valued at around USD 50 million, indicating a dependency on foreign technology for dairy production and processing.

These statistics highlight Iraq's substantial reliance on imports for both dairy products and the machinery essential for dairy production, emphasizing the need for investment in domestic dairy infrastructure and technology to reduce this dependency.¹⁶

Overall, KRI's dairy sector faces significant challenges in achieving self-sufficiency, with a substantial dependence on imports to meet local demand. Currently, the sector only meets around 10% of fresh milk demand and 25% of milk powder demand, with imports filling the remaining need. Approximately 90% of fresh milk and 75% of milk powder come from neighbouring countries like Turkey, Iran, and Gulf Cooperation Council (GCC) states. This heavy reliance on imports, particularly on subsidized products, highlights vulnerabilities to external market fluctuations (FAO, 2023¹⁷).

The demand for dairy products in Iraq is projected to rise at a CAGR of 8% by 2025, fuelled by a young population—almost 60% of Iraqis are under the age of 25—which represents a significant economic strength for the country. In this context, the average per capita consumption of dairy products is expected to increase from 52 litres to over 60 litres within the next three years, and potentially surpass 90 litres by 2025.

Strategic Opportunities for Increased Self Sufficiency

To address these challenges, KRI could focus on improving local production capabilities by investing in feed production and dairy processing infrastructure. Given the favourable climate and available land, policies that support local feed production—such as subsidies or production incentives—could substantially lower production costs and enhance competitiveness. The dairy market in Iraq opens up more than USD 4 billion in investment opportunities, particularly in areas such as cattle breeding farms, plant management, and logistics¹⁶.

Overall, the significant gap between local production capacity and import reliance presents a prime opportunity for international companies and investors to engage with KRI's dairy market, tapping into the unmet demand and enhancing productivity and sustainability. The dairy market in Iraq has been experiencing notable growth, driven by increasing consumer demand and evolving market dynamics.

¹⁶ International Trade Centre (2022). Iraq agribusiness market research and consumer insights: a technical brief. ITC, Geneva Retrieved from: <https://www.intracen.org/fr/media/11356>

¹⁷ FAO. 2023. The State of Food and Agriculture 2023. Revealing the true cost of food to transform agrifood systems. Rome. Retrieved from: <https://openknowledge.fao.org/items/1516eb79-8b43-400e-b3cb-130fd70853b0>

Iraq's dairy market is poised for continued growth, driven by rising consumer demand and evolving market dynamics. However, addressing challenges in domestic production, supply chain efficiency, climate change and economic stability will be crucial for sustaining this growth trajectory.

4. Animal health and veterinary services

Legislation

There is law on control of disease as Animal Health Act 32 – 2013¹⁸. The act lays down provisions to maintain health and safety of animal wealth; develop the livestock sector and upgrade its production, also as a food security tool; preserve the safety of products of animal origin; provide a healthy animal food for humans free of pathogens; and encourage investors in the livestock sector in support of the national economy.

The law on Veterinary System No.84 of 1937 regulates procedures regarding animal health. Chapter I regards the Veterinary measures that need to be taken at the border which include (i) the presentation of a Health certificate attesting to the health of the area of origin of the animals, number of heads, and other information specified in article 2; (ii) establishment at the entry points of specialized areas to accommodate animals; (iii) mandatory quarantine for animals not accompanied by a health certificate; (iv) measures in case of animal disease; (v) rules for products' packaging, including food products; (vi) ban on importing animal products harmful to human health; (vii) ban on importing animals from a country where diseases are widespread, with specifics regarding the types of disease and the days of duration of the ban. Chapter II deals with general measures to be taken when a disease breaks out within the country, including (i) the authorities who must be informed; (ii) veterinary measures; (iii) control and isolation of sick animals; (iv) prohibition of entry and exit of other animals from the area; (v) duties of the veterinarian.

There is also a law on slaughtering of animals from 1972¹⁹. This law lists the animals excluded from the slaughtering depending on their age or weight. It is also forbidden to slaughter pregnant animals.

On breeding, there is a more recent Law No. 8 of 2023 regarding the management of animal genetic resources. This Law comprising 12 articles has been issued to organize the process of collecting, preserving, maintaining, and exchanging animal genetic resources and ensure their sustainable use as they are the strategic repository of the diversity of animal genetic resources in Iraq, protecting them from extinction and loss. It applies to local animal genetic resources, their derivatives, and the benefits arising from their use and exchange. It also aims to regulate the entry of non-local genetic resources into Iraq in a manner consistent with plans for the conservation and sustainable use of local animal genetic resources. Animal genetic resources are considered the property of the State, adhering to the principle of national sovereignty. While recognizing citizens' property rights in live circulating breeds, a National Bank for Animal Genetic Resources is mandated by Article 3 within the Department of Protection of Animal Genetic Resources. The National Bank's key responsibilities include recording and preserving genetic resources, conducting research, genetic improvement for sustainable livestock use, organizing international exchanges, restoring breeds in extinction cases, protecting owners' rights, preparing reports, studying agreements, and overseeing license applications for genetic resource collection and trade. Additionally, a Permanent Advisory Committee for Animal Genetic Resources is established within the Ministry, focusing on formulating policies, providing advice on management and development, and facilitating coordination among

¹⁸ Food and Agriculture Organization of the United Nations. (2013). Animal health act No. 32 of 2013 [لسنة 2013 عن الصحة] القانون رقم 32 (القانون رقم 32). FAOLEX Database. Retrieved 31 October, 2024, <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC143459>

¹⁹ Food and Agriculture Organization of the United Nations. (1972). Law No. 22 of 1972 on the slaughtering of animals [لسنة ١٩٧٢] انون رقم ٢٢. FAOLEX Database. Retrieved 31 October 2024 <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC100241>

relevant parties. Article 6 emphasizes the supervision of local animal genetic resources outside their natural habitat by the Department of Livestock, ensuring compliance with international standards. It prohibits scientific research or activities altering the genetic nature of the population without the Department's approval. Article 7 mandates Ministry approval for the import or export of live animal genetic sources.

The Veterinary Medical Progression Law No. 136 of 1980²⁰ aims to ensure distribution of veterinary college graduates to the countryside and the delivery of veterinary medical services to remote places in line with the recommendations of the Office of Educational Affairs. It establishes an Advisory Committee in the Ministry of Agriculture and Agrarian Reform and defines its duties to oversee implementation of the training curriculum, and to distribute the veterinarians on the different agricultural communities, districts and villages.

Iraq has been a member of the World Organisation for Animal Health (WOAH) since 1928. This membership is significant because it grants the country access to WOAH's extensive network of experts and allows Iraq to participate in international advancements related to the diagnosis, surveillance, and eradication of animal diseases.

Animal identification and registration

There is no national animal identification and registration system. However, in modern commercial farms all animals are identified and registered in a farm management system. Local breeders sometimes colour sprays for identification (Interviews).

Disease surveillance - Government programmes (vaccination, testing)

There exist several animal disease control programmes, such as for vaccination against Foot-and-Mouth Disease (FMD)²¹. Traditionally, serotypes O, A, SAT, and Asia 1 were reported from the region. However, recently, a new SAT2 FMD strain occurred in Iraq²², and a joint meeting was held between the Ministry of Agriculture and the Veterinary Department with the participation of FAO experts on June 15, 2023 to discuss control measures for the disease. For FMD compulsory vaccination programmes exist for cattle and for goats, as well as for Peste des Petits Ruminants (PPR), and Sheep and goat pox. To control Crimean-Congo Haemorrhagic Fever (CCHF), which is a zoonosis, spraying or dipping against the ticks that transmit the disease is practised. However, there is a lack of sufficient vaccines and veterinary drugs (also against parasites) and test kits (Interviews).

The need to improve animal health in Iraq is urgent. Animal diseases, often unnoticed as hidden losses, greatly diminish the profitability of livestock by increasing the costs of production²³. The Iraqi dairy sector suffers from limited local expertise in animal health issues, low fertility and production, subpar genetics, low cow reproductive rates, and seasonal feed availability and milk production. The use of veterinary drugs and antibiotics is prudent, but antimicrobial resistance is an issue. The most threatening disease are FMD, and sheep and goat pox, due to the insufficient control, and difficulties controlling the import and movement of animals via the many open borders. The vaccinations for official control programmes are performed by official veterinarians (Interviews).

²⁰ Iraq. (1980). Law No. 136 of 1980 on the veterinary medical progression [1980 لسنة 136] (قانون التدرج الطبي البيطري رقم 136). Retrieved 31 October 2024, from <https://faolex.fao.org/docs/pdf/irq100318.pdf>

²¹ Food and Agriculture Organization of the United Nations. (2023, June 17). Emergency response mission for foot and mouth disease in Iraq. ReliefWeb. Retrieved from <https://reliefweb.int/report/iraq/emergency-response-mission-foot-and-mouth-disease-iraq>

²² ProMED-mail. (2023, April 14). Foot & mouth disease - Iraq (07): livestock, serotype SAT-2, topotype XIV, spread, WOAH [ProMED-post]. International Society for Infectious Diseases. <https://www.wrlfmd.org/news/2023/04/iraq-07-livestock-serotype-sat-2-topotype-xiv-spread-woah>

²³ World Organisation for Animal Health. (n.d.). What is the Global Burden of Animal Diseases (GBADs) <https://www.oie.int/en/what-is-the-global-burden-of-animal-diseases-gbads>; Global Burden of Animal Diseases. (n.d.). *GBADs – Global Burden of Animal Diseases*. University of Liverpool. <https://animalhealthmetrics.org/>

Veterinary profession and education

There are approximately 2200 veterinarians in KRI (Interviews). A Syndicate of Veterinarians in Kurdistan Region of Iraq exists, as well as a Syndicate of Veterinarians in Iraq.

There are more than 10 academic centres with veterinary education in Iraq. Three centres for veterinary education are present in KRI: one at the Salahaddin University in Erbil, one in Sulaymaniyah (College of Veterinary Medicine at Sulaymaniyah Governorate)²⁴ and one in Duhok²⁵. Each year total approx. 120 students graduate in KRI. There are also veterinary education centres in Baghdad, Mosul²⁶, Najaf²⁷, and several more cities in Iraq. Many veterinarians work in companies (Interviews), and also some in private clinics in cities, mostly dedicated to companion animals. There are also veterinarians employed by the government who work in animal resource departments and provide extension services to farmers. Approximately 50%-60% veterinarians work in companion animal practices, and approximately 40-50% in poultry. There are no private veterinary clinics for cattle. The government runs about 95 veterinary centres in the 15 governorates in Iraq, each with staff of 10-25 persons. The public image of veterinarians is improving, because of growing market of companion animals, and because attention for zoonotic diseases is growing. There is also an Iraqi veterinary journal since 1977.²⁸

A special role play animal health workers, that are not veterinarians, but who execute many animal health tasks, especially in areas where no veterinarians are present. Significant training support has been provided by FAO²⁹.

There are two central laboratories that operate under control of the government for animal diagnosis: in Baghdad and in Erbil. Both laboratories have received in the past significant support from FAO and USAID in training and supplies³⁰. There is also a veterinary laboratory in Sulaymaniyah and Duhok, and several private laboratories. They operate ELISAs and PCR tests, among others (Interviews).

Farmers education and extension

There are multiple vocational schools for agriculture in Iraq, including in KRI. There are schools that operate at primary and advanced level (High Agricultural Institute at the Faculty of Agriculture, at Abu-Ghraib). In the field of Iraqi agricultural extension, the Iraqi educational system is an important factor to further develop. Salih reported in 2017 that approximately 46% of the farmers have no formal agricultural education and researchers agree that further education of Iraq extension personnel is needed and can be achieved using specialists from more developed countries. Knowledge of modern dairy practices is lacking. An additional problem is illiteracy: in 1980 the Arab States were able to attain 51.3% literacy rate, an increase of 11% from the previous decade (40.8%) (Salih, 2017; Interviews). There is no gender equality in extension services, that is dominated by men.

²⁴ University of Sulaimani. College of Veterinary Medicine.

https://vmed.univsul.edu.iq/?_gl=1%2A16k8my4%2A_ga%2AMTk5NzA3MTk0My4xNzI3NTQ4MDQ1%2A_ga_D3QYGZ56JJ%2AMTcyNzU0ODANc4wLjAuMA.

²⁵ University of Duhok. *About the University of Duhok*. <https://www.uod.ac/>

²⁶ University of Mosul. College of Veterinary Medicine. Retrieved October 20, 2023, from <https://uomosul.edu.iq/en/veterinarymedicine/>

²⁷ University of Kufa. *Faculty of Veterinary Medicine*. <https://vet.uokufa.edu.iq/en>

²⁸ University of Baghdad, College of Veterinary Medicine. (1977). The Iraqi journal of veterinary medicine.

<https://jcovm.uobaghdad.edu.iq/index.php/Iraqijvm>

²⁹ Food and Agriculture Organization of the United Nations. (2024). Improving the delivery of animal health services and disease surveillance in the targeted governorates in Iraq. Retrieved from <https://openknowledge.fao.org/server/api/core/bitstreams/642335bb-c6b1-4247-9966-586480a1dd6e/content>

³⁰ Food and Agriculture Organization of the United Nations. (2024). Improving the delivery of animal health services and disease surveillance in the targeted governorates in Iraq. <https://openknowledge.fao.org/server/api/core/bitstreams/1f8e1271-bceb-42fd-b805-22e2e2cd91a4/content>

Veterinary medicine use and antimicrobial resistance (AMR)

In Iraq, the regulation of veterinary medicines is governed by specific laws requiring the registration of such products. However, the enforcement of these regulations presents challenges, as veterinary drugs are often available for purchase without stringent oversight. This situation poses potential risks to animal health due to the lack of independent quality control, and to human health through residues in animal products like milk and meat, as well as the development and spread of antimicrobial-resistant bacteria (Interviews).

The government has implemented measures to monitor the sale of veterinary medicines. Despite these efforts, reports indicate the presence of counterfeit drugs in local markets, including imitations of established brands. A study published in *Pharmaceutical Medicine* highlights the prevalence of substandard and falsified medications in Iraq, emphasizing the need for effective pharmacovigilance and regulatory enforcement to safeguard public health.³¹

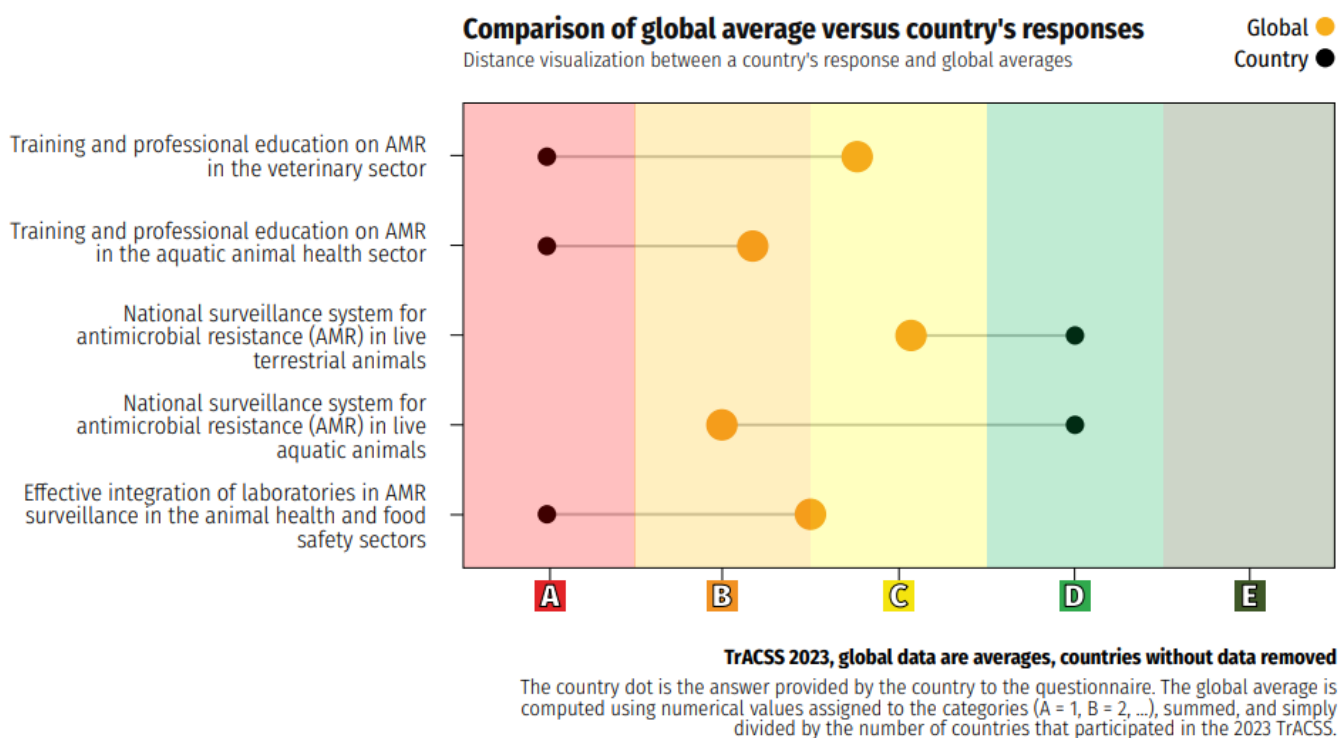
According to the Tracking AMR Country Self Assessment Survey (TrACSS) country report of 2023 by WHO, Iraq is implementing a National Action Plan against antimicrobial resistance³²(**Figure 7**). Iraq has a national surveillance system for antimicrobial resistance (AMR) in live terrestrial animals and in live aquatic animals, but training and professional education in the veterinary sector, and effective integration of laboratories in AMR surveillance in the animal health and food is lacking. The country has laws or regulations on prescription and sale of antimicrobials for terrestrial and aquatic animal use and has laws or regulations on prescription and sale of medicated feed. Iraq is however not yet using relevant antimicrobial consumption/use data to inform operational decision making and amend policies.³²

Addressing these challenges requires a multifaceted approach, including strengthening regulatory frameworks, enhancing quality control mechanisms, and increasing awareness among stakeholders about the risks associated with counterfeit veterinary products. Collaborative efforts between governmental bodies, veterinary professionals, and international organizations are essential to ensure the safety and efficacy of veterinary medicines in Iraq.

³¹ Al-Jumaili, A. A., Younus, M. M., & Saleh, M. Z. (2021). The epidemic of substandard and falsified medications in Iraq: Evaluating the effectiveness of national pharmacovigilance alerts to community pharmacies. *Pharmaceutical Medicine*, 35(3), 169–186. <https://doi.org/10.1007/s40290-021-00386-9>

³² Tracking AMR Country Self Assessment Survey (TrACSS). (2023). TrACSS 2023 Country Report: Iraq. World Health Organization. https://amrcountryprogress.org/download/profiles/2023/english/EN_IRQ_TrACSS_2023_Iraq.pdf

Figure 7 Iraq's self assessment on national capacity and progress on controlling AMR in animals for 2023



Source: Tracking AMR Country Self Assessment Survey (TrACSS). (2023). TrACSS 2023 Country Report: Iraq. World Health Organization. https://amrcountryprogress.org/download/profiles/2023/english/EN_IRQ_TrACSS_2023_Iraq.pdf access 31 Oct 2024

5. Animal welfare

Until recently, Iraq had no law on animal welfare. However, in 2022, the Parliament of the Kurdistan Region passed its first animal protection law that protects both wild and domesticated animals from abuse. The new law prohibits all animal fighting, killing wild animals, and the killing of stray animals by any means (unless they pose “specific risks” to people and or other animals). Stray animals populations will be controlled with “fertility control” performed by official veterinarians. Each province will secure some land dedicated to sheltering stray dogs. The new law is based on Islamic law, and bears similarities to animal welfare legislation in the region and Europe, and the UK’s five freedoms relating to animal welfare: protection from hunger and thirst; discomfort; pain, injury or disease; the freedom to express normal behaviour, and freedom from fear and distress.

The issue is relatively new but is gaining support in the public debate. An animal rights organisation active in Iraq is KOARP (Kurdistan Organization for Animal Rights Protection): a professional, volunteer, non-government, independent organization focusing on animal rights’ protection in the Kurdistan Region of Iraq, especially for donkeys and horses, and stray dogs³³.

³³ Kurdistan Organization for Animal Rights Protection. (2019). Our mission: Our goals and vision for Kurdistan. KOARP <https://www.koarp.org/>

6. Animal feed market and suppliers

There is a law on animal feed. This regulates the content and trade of feed. Key players in animal feed are Erbil Feed company for KRI³⁴, the Barash Feed Company (BFC)³⁵, Zain Al Mutaqadima Animal Feed Production Company³⁶, the Sedekan company³⁷, Niyasin Company³⁸ and Rova company³⁹. Under the new policy of the ninth cabinet of the KRI, livestock-related projects are stimulated, and 450 new projects have been announced, some of which export to southern and central Iraq and beyond. These government efforts have also led to substantial increases in wheat production, with yield nearing two million tons in 2022. In 2022, the production cost of one ton of corn was 200,000 Iraqi Dinars (IQD), with selling prices up to 650,000 IQDs, making the efforts of farmers worthwhile (Source: Kurdistan24 news). However, water shortage is a challenge (see Chapter 9).

7. Milk collection, quality control

To date, there is no law or regulation on milk quality. For small holders, milk is sold mainly locally, and not collected. However, the ZOM company⁴⁰ has initiated a system of milk collection from smallholders, using specific milk collection centres (MCCs). Milk is tested at these centres before being transported to the factory in tankers for processing. Smallholders milk cattle by hand, whereas the larger dairy farms use machine milking. Milk is collected from large dairy farms by the dairy processing companies (Interviews).

To date, there is not a quality-based milk payment scheme (QBMPS) operational. A QBMPS links payment to quality criteria, thereby incentivising high quality milk (based on indicators such as low somatic cell count, and high fat%).

Good milking practices, such as use of stainless-steel buckets, and proper cleaning and disinfection protocols for milkers and milking equipment are crucial to improve milk quality, also for smallholders.

To date, there is not a food safety authority in KRI nor Iraq.

8. Consumption of dairy products

From the interviews we were informed that the average consumption of milk in the Kurdistan Region reaches 495.000 tons annually, and that the average annual per person consumption of milk is approximately 80 L, meaning an average of 0,2 l/day/person in the region. Allegedly, consumption per year was in 2018 52 litres, thus the milk consumption has increased. However, we were not able to confirm these data. Consumers drink both fresh milk and heat treated (UHT) milk, there seems not to be an overall preference for either one (Interviews). In addition, yogurt and cheese are common on the market. There are not yet sustainable alternatives for milk on the market (milk replacers), such as soya or oat milk (Interview). Consumers buy milk in big cities mostly from the supermarket (mostly imported milk from Saudi Arabia) and in villages from smallholders.

³⁴ شركة أربيل فيد..شركة أربيل فيد لانتاج كافة انواع الاعلاف Retrieved October 25, 2023, from <https://erbilfeed.com/>

³⁵ Iraq Feed Company. About Iraq Feed Company. <https://www.iraqfeed.com/>

³⁶ Zain Al Mutaqadima Feed Company. Zain Feed. <https://www.zainfeed.com/en/>

³⁷ Sedekan. About Sedekan company. <https://sedekan.com/en/>

³⁸ Niyasin (2023). The General Company for Trading Animal Feed and Related Products. Retrieved from <https://www.niyasin.com/>

³⁹ ROVA (2023). A legacy of agricultural excellence. Retrieved from <https://www.rova-iraq.com/>

⁴⁰ Zom (2023). <https://www.zomcompany.com/>

9. Sustainability aspects throughout the value chain

9.1. Economic, labour and social aspects, environment & climate

Economic

Smallholder farmers find dairy production profitable when raw milk prices are around 900 IQD per litre. Seasonal price fluctuations however pose a significant challenge for farmers, particularly during low seasons, leading to milk prices from 900 IQD during peak seasons to 700 IQDs during low seasons. For big farmers milk prices of 1000-1500 IQDs were reported (Interviews).

The farmers price of sheep milk is about 1500-2000 IQD/l (Interviews).

The price of goat milk is about 1000 IQD/l (Interviews).

The milk price for consumers is around 2000 IQD/l for cattle, and around 1500 IQD/l for goat milk (Interviews). Sheep milk and yogurt is in high demand. The price for consumers is between 3000 - 4000 IQD.

The government stimulates economic development by subsidies in the form of reduction of fees and facilities for agricultural investments. Also, there are import levies on import of dairy products, but they are modest and do not reduce import of dairy products (Interviews).

Labor and social aspects

Agriculture is the most important source of rural employment (74%), especially among women: 44% of total woman's employment is in agriculture, while 16% for man (2017). Dairy farmers are nearly 100% masculine (Jongerden et al., 2019). Current estimates are 70% of rural employment is in agriculture. However, overall, 87% of women in Iraq are economically not employed. In KRI, only 12% of women are economically active (UNESCO, 2019).

Figure 8 Woman (left) and man (right) herding cattle on free pasture near Ranya (Little Zab River)



Courtesy: Consulate General of the Kingdom of the Netherlands, Erbil

Environment and climate

-Water

Water availability is an increasing issue. Due to climate change and water disputes in the region scarcity of water is an increasing problem in KRI. The International Organization for Migration (IOM) reported that over 62.000 individuals were displaced by September 2022 due to water scarcity affecting agricultural and livestock needs.⁴¹ This is an even larger issue in the rest of Iraq, which also faces salinity problems. Modern dairy farming depends on wells for irrigation but is costly. Rising temperature, limited water resources and extensive drought periods, salinization and generally unsustainable crop, land and water management practices pose significant challenges to Iraq's agriculture and food security. Ultimately, Iraq's dairy sector faces decreasing pastureland and forage availability for livestock. Water availability is an increasing issue as modern dairy and cow farming depend on costly wells for irrigation. An opportunity lies in underutilized, seasonally abundant rainfall in KRI. Circular production is not a well adopted concept as yet, but water harvesting techniques and re-use should be part of new projects as a matter of risk-reduction and business sustainability. Water-harvesting techniques and re-use will be important targets to address in new dairy projects.

Rainfall has been estimated at 150-1500 mm/year (UNDP, 2019). For comparison: In the Netherlands rainfall is approximately 875 mm/year, that varied between 436 in 1921 and as highest 1111 mm in 1998⁴². In Iraq, areas that receive less than 400 mm annually are most heavily impacted by climate change. The KRI has high rainfall precipitation compared to the rest of Iraq in the centre and south with annual averages ranging from 350 mm in the Erbil area to more than 1100 mm at Sherwan-Mazen in the high mountains bordering Iran (UNDP, 2019). In the KRI various microclimatic zones can be distinguished due to the diverse geography, with different rainfalls: high⁴³; medium and low (Jongerden et al., 2019 Ministry of Planning 2021).

In the Kurdistan Region of Iraq (KRI), over 70% of farmers rely on shallow wells for irrigation, but groundwater regulation remains vague and enforcement weak, with monitoring that is largely limited to a few observation wells (MoP, 2012). This limited regulatory oversight leaves farmers without sufficient information or guidance on sustainable water usage. Consequently, groundwater resources are increasingly overexploited, with wells reaching depths of 150 to 350 meters, substantially raising operational costs for farmers and threatening long-term agricultural productivity.⁴⁴

Impact of water scarcity on the Dairy Sector

Water scarcity has specific ramifications for Iraq's dairy sector. Rising temperatures, extended droughts, and salinization are reducing crop yields and forage availability, creating significant obstacles for livestock feed and water needs. Dairy farming requires consistent water for both forage cultivation and animal hydration, making it particularly vulnerable to the country's current water crisis (⁴⁵ Foreign Policy Research Institute, 2023).

In response to these challenges, the KRI implemented restrictions on certain water-intensive crops during the 2022 and 2023 growing seasons. This measure underscores the need to prioritize water-efficient agricultural practices and manage resources prudently under changing environmental conditions.

⁴¹ <https://edf.iom.int/publications/67/In-Search-of-Economic-Opportunities-for-Agribusinesses-in-Iraq---VCA-SAD-%26-Diyala---11102021.pdf>

⁴² <https://www.clo.nl/indicatoren/nl050809-jaarlijkse-hoeveelheid-neerslag-in-nederland-1910-2022>

⁴³ Values differ between sources: Jongerden et al: high: 700-1100 mm, medium: 400-700 mm and low: 400 mm; Ministry of planning: high: > 500 mm, medium: 350-500 mm and low: < 350 mm

⁴⁴ https://auis.edu.krd/iris/sites/default/files/Water%20Policy%20Report%20IRIS_FINAL%20ES.pdf

⁴⁵ Salih, M. A. (2023, October 20). A nation must think before it acts: Water and climate change will shape Iraq-Turkey relations. Foreign Policy Research Institute. Retrieved <https://www.fpri.org/article/2023/07/water-and-climate-change-will-shape-iraq-turkey-relations/>

Soil Quality and Degradation; Environmental Pollution (Residues, Herbicides, and Pesticides); Biodiversity

Regarding soil quality and degradation, environmental pollution, and on biodiversity little is documented for KRI and Iraq. Although the government in Iraq has not developed specific policies of farming practices for the conservation of the ecosystems and long-term food security, there are several initiatives that promote nature-inclusive agriculture⁴⁶. More nature-inclusive agricultural practices will be needed to restore and preserve the unique nature in KRI and Iraq, requiring dairy development practices to consider soil degradation, and prevent water and soil pollution, as well as preserve biodiversity. An important component is use of manure, which should be regarded as an important internal farm resource, and not as waste. Improving grass-land based farming can improve the quality of the manure, resulting in a better soil biology and in return improves grassland yields (Van der Ploeg et al., 2019). Agroecology, and nature-inclusive farming are approaches that need to be considered in the development of new sustainable business models for profitable dairy farming. Iraq also ratified the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC) and in that framework the government works on plans and programs.

10. Iraq dairy industry market entry – Case study

Livestock products in the Kurdistan region are meat, milk, skin, and fibres. Sulaymaniyah governorate has the biggest share in animal farms of the region. Cattle (6.7%), Sheep (72.45%), goats (20.7%), and buffalo (0.15%) are the most common farm animals (Neimi and Hassan, 2020).

For the Iraqi dairy industry, entering the international dairy market several issues need to be addressed at different levels:

- farmers education: farmers need to be well educated in dairy production. Primary care is good feed and sufficient access to clean water. Healthy animals produce good milk, and animal care needs to be at a high level to ensure absence of infectious diseases (FMD, Sheep and goat pox, Lumpy Skin Disease, bovine tuberculosis and brucellosis, Johnes disease, anaplasma and theileriosis as main threats). Secondly, high quality of milking techniques needs to be ensured, both for hand milking as machine milking (hygiene, maintenance of equipment, quality protocols);

- reliable dairy value chain: a healthy dairy industry builds upon a strong primary production (good farmers and healthy cattle), a strong milk collection system, and a high-quality milk processing;

- stability in milk supply and quality: an adequate feed strategy is needed to overcome shortage of feed during the dry season, and a strong milk quality chain, based on independent milk laboratory testing, and quality protocols throughout the supply chain;

- environmental impact and climate resilience: dairy production must not harm the environment but be embedded in an approach as close as possible to agroecology, and nature-inclusive farming. Prudent use of water, and preservation of soil quality through wise use of the manure must prevail to ensure sustainable dairy production that can withstand future climatic and regulatory challenges.

For Iraq and KRI, there is prospect to future develop dairy production, however, care must be taken on the location and size of dairy farms for cattle, sheep and goats, the training and education of farmers, veterinarians and extension workers in cattle, sheep and goats health and welfare, and dairy production, and the required technical and logistical infrastructure (milk collection and milk laboratory testing capacities).

⁴⁶ Ministerie van Landbouw, Natuur en Voedselkwaliteit. (2023, October 19). Iraq invests in integrated pest control, regeneration of wetlands and reforestation. Agroberichten Buitenland. Retrieved <https://www.agroberichtenbuitenland.nl/actueel/nieuws/2023/10/19/iraq-invests-in-integrated-pest-control-regeneration-of-wetlands-and-reforestation>

Figure 9 Sheep farm in Erbil (left) and Duhok (right) with sheep (Awassi Breed (also called Shujeri)



Courtesy: Consulate General of the Kingdom of the Netherlands, Erbil

11. Overview of challenges and opportunities, SWOT of the sector

Feed production

The land is suitable for feed production but not subsidized, and locally growing crops faces much competition from subsidized imports (soy from Latin America, maize from countries in the region). With much better biophysical conditions than the rest of Iraq and many of the surrounding countries, KRI has the potential to produce most of its own feed and dairy. The opportunity lies in growing more feed with less river or groundwater irrigation. Rainfed fodder production and managed grazing/foraging are underdeveloped in KRI, as are the use of often endemic crop varieties that can extend the growing season and year-round feed availability, while providing better nutrition to animals. These opportunities will help lower the water footprint of KRI for dairy production. Noteworthy is that the federal government receives large quantities of harvested wheat from KRI at subsidized prices.⁴⁷

To foster growth in the dairy sector, Iraqi milk production must enhance efficiency and reduce costs of production. A main challenge is to secure year-round supply of fodder, because at present dairy production drastically falls during almost half the year when harvests are lower. Growing different silage and forage is a challenge, as is optimizing the use of natural seasonal rainfall.

To improve feed quality and reduce feed cost, the green fodder sector in Iraq must develop. The local maize grain sector has grown rapidly in response to increased demand for livestock feed. However, important green fodder crops such as alfalfa, that are a crucial part of commercially viable dairy production systems, have yields at levels not comparable with regional neighbours such as Jordan. Water use efficiency is also often poor, in the context of declining water availability.

⁴⁷ Kurdistan 24. (2023, May 20). Iraq to receive Kurdistan Region farmers' wheat. Retrieved from <https://www.kurdistan24.net/en/story/395203/Iraq-to-receive-Kurdistan-Region-farmers%E2%80%99-wheat>

The introduction of new varieties such as berseem, hybrid forage sorghum, new varieties of alfalfa, fodder beet, kale, and oats allow growth over the winter in KRI, taking advantage of natural rainfall, supporting higher levels of feed production. In addition, techniques for forage conservation such as silage and hay making can reduce the seasonal fall in dairy production, without needing to use reconstituted milk powder by dairy processing companies.

As well as agronomic and conservation solutions, new business models have a huge potential, such as contract farming (already being introduced by Best Feed) and cooperation between different region in Iraq. Central and Southern Iraq have climatic advantages to grow silage year-round, reducing the need for imports and keeping dairy production more stable.

Animal health, milk quality and productivity

Dairy producers face varying challenges in Iraq. There is a limited access to veterinary services, especially among smallholders. As previously mentioned, there is a lack of quality feed and seasonal variability of dairy production, while water scarcity poses challenges for dairy farmers, as dairy animals require significant amounts of water for proper hydration and milk production. Furthermore, poor breeding practices (although some semen is imported from the Netherlands and other foreign countries), animal fertility and reproduction rates, and subpar genetics, are main challenges. Finally, the access to knowledge is limited to educate dairy farmers about best practices in animal health, nutrition, and management. There are concerns about food safety and milk quality also reaching the media⁴⁸. Disease rates and mortality among cattle, sheep and goats is high, which is a risk for investments in the animal sector (Interviews). There is a lack of dairy knowledge at Government Veterinary Centers: the services provided by government-run veterinary centers face challenges in meeting the needs of dairy farmers. Also private veterinary services need to be developed: currently veterinary clinics are mainly available for pets in large cities. In addition, the veterinary profession is not very popular among youth due to low salaries (Interviews).

Value chain development and farmer organization

Iraq has a real 'dairy culture' and used to be self-sufficient due to a strong interest in locally produced milk products, however, a turbulent recent history, lack of knowledge, expertise and supply chain inputs has greatly reduced local production, and in parallel also food security and rural communities' development. To help restore prosperity, government has prioritized developing the agriculture sector, with environmental sustainability an increasing focus. Local investors are becoming drawn to dairy production and processing, and several large-scale dairy projects are operational, with more in progress or planning stages. Leading these efforts in Iraq is the Kurdistan Region of Iraq (KRI), which could potentially supply the whole of Iraq. Prime example of these developments is the ZOM dairy factory. Located in Zhazhok village, Mergasor, the factory has generated employment opportunities for 300 individuals, currently benefiting over 1.800 farmers and their families in the region. The ZOM factory holds the distinction of being the first among seven large dairy project factories to receive a permit from KRI⁴⁹. These dairy projects help fulfil the local demand and significantly strengthen the economic infrastructure and livelihoods of farmers and animal owners in KRI. Also, by setting higher standards for milk quality that is locally collected and processed, food safety and milk quality is reassured, to prevent that young children are fed unregulated, low-quality formula milk⁵⁰.

⁴⁸ Rudaw. (2022, April 11). Bad quality, unregistered foodstuff plague Kurdistan Region markets. Retrieved from <https://www.rudaw.net/english/kurdistan/110420221>

⁴⁹ Kurdistan Regional Government. (2023, May 31). Prime Minister Barzani opens the Zom dairy factory in Mergasor. Retrieved <https://gov.krd/english/government/the-prime-minister/activities/posts/2023/may/prime-minister-barzani-opens-the-zom-dairy-factory-in-mergasor/>

⁵⁰ Rudaw. (2022, April 11). Bad quality, unregistered foodstuff plague Kurdistan Region markets. Retrieved from <https://www.rudaw.net/english/kurdistan/110420221>

Table 8 SWOT table for dairy sector in Iraq

<p>Strengths</p> <ul style="list-style-type: none"> -history of strong dairy production sector (KRI) -entrepreneurial spirit -local breeds -water availability KRI high compared to rest of Iraq 	<p>Weaknesses</p> <ul style="list-style-type: none"> -technical assistance, training and capacity building: low dairy education level of farmers, extension workers, veterinarians -high disease rates and mortality among cattle, sheep and goats -low milk quality system -high milk price fluctuation -lack of suppliers and service providers for a sustainable dairy value chain -low organisation level of dairy farmers -no animal identification and registration system -no animal movement registration system -lack of control on veterinary medicine use and AMR
<p>Opportunities</p> <ul style="list-style-type: none"> -dairy market demand (self-sufficiency of 10%) -yoghurts, whey products, and sheep milk cheeses are very popular. Most yoghurts for sale in the supermarkets are made with imported milk powder -government commitment and support (policy, project investments, subsidies) -knowledge centers available (Universities, extension services) -several modern dairy farms and factories developed/under development -existing business relations Kurdish companies and Dutch companies -energy efficiency possible (solar panels, biogas..) -job opportunities for youth (incl. women) in dairy 	<p>Threats</p> <ul style="list-style-type: none"> -climate change -water shortage -competing claims on land -political instability -imports of milk and milk powder -antimicrobial resistance

12. Overview of current links with Dutch knowhow, trade and collaboration and its challenges and opportunities for the near future

Links with Dutch knowhow, trade and collaboration

Several key areas currently link the Dutch dairy sector to the Kurdistan Region of Iraq (KRI) and Iraq, encompassing technical assistance, training, and delivery of supplies, machinery, and equipment:

1. *Cost and Energy-Efficient Production*

- **Supply Chain Stability:** Dutch expertise supports a reliable dairy supply chain, from farmer to processor to retailer, establishing resilience in milk pricing, cost management, and quality assurance (Netherlands Enterprise Agency, 2022).
- **Stable Market Practices:** Dutch insights on maintaining cost-efficient, high-quality milk production at stable prices have potential to enhance the Iraqi dairy sector's competitiveness in the region.

2. *Climate-Smart and Water-Efficient Techniques*

- **Water Reuse and Conservation:** Given Iraq's water scarcity, Dutch expertise in water reuse and efficient irrigation systems, tailored for drought-prone areas, offers valuable solutions for sustainable dairy farm management.
- **Energy Efficiency:** Dutch innovation in renewable energy, including solar and biogas systems, could reduce dependency on costly energy sources in Iraq's dairy operations, aligning with global sustainability trends.

3. *Advanced Dairy Housing and Farm Equipment*

- **Housing and Barn Design:** Dutch companies provide advanced barn and stable designs that enhance cow comfort and health, potentially improving productivity and animal welfare standards.
- **Farm Equipment and Setup:** Assistance in setting up modern dairy farms with efficient milking systems, cooling technologies, and semi-hard cheese production equipment is increasingly sought in Iraq as quality-focused production expands.

4. *High-Quality Milk Production and Processing*

- **Good Milking Practices:** Dutch training in best milking practices, milk sampling, and laboratory testing offers tools for establishing a reliable milk supply chain in Iraq.
- **Processing Technologies:** Dutch companies specialize in milk cooling and cheese processing technologies, essential for maintaining milk quality and expanding Iraq's dairy product offerings.

5. *Nutrition, Feed, and Storage Solutions*

- **Fodder Storage Systems and Seeds:** Dutch expertise in feed quality and fodder storage solutions can help Iraq's dairy farmers optimize nutrition, potentially lowering feed costs and boosting milk yield.

6. *Animal Health and Welfare*

- **High-Quality Cattle Genetics:** Dutch breeding programs offer high-quality genetic resources, improving livestock health and reducing disease prevalence.
- **Veterinary Services:** Dutch support in establishing veterinary care systems and prudent use of antibiotics can significantly lower health risks for livestock, as well as support in disease detection, disease monitoring and surveillance and laboratory testing.

7. *Antimicrobial Resistance (AMR) Management*

- **Prudent Antibiotic Use:** Dutch guidance on AMR focuses on minimizing antibiotic reliance, which is essential for maintaining animal health and consumer safety, given Iraq's limited AMR regulations.

8. *Environmentally Sustainable Practices*

- **Water and Waste Management:** Dutch companies' expertise in water management and waste disposal aligns with the growing need for environmental sustainability in Iraq's agriculture sector. Solutions such as water treatment, soil degradation prevention, and waste recycling could significantly improve the ecological impact of Iraq's dairy industry.

Challenges and Opportunities for the Near Future

9. *Competitive Landscape*

Dutch companies face stiff competition from Turkish and other regional suppliers, who often offer lower-priced but lesser-quality supplies and equipment. This competitive market challenges Dutch suppliers to demonstrate the long-term benefits of their higher-quality products. Iraq's interest in Dutch solutions tends to grow as issues with lower-quality products emerge, creating a market for Dutch expertise in a maturing dairy sector where the focus shifts towards quality, durability, and compliance with international standards.

10. *Emerging Market Potential*

Opportunities for Dutch companies are substantial as Iraq's dairy sector matures and places greater emphasis on milk and cheese quality and sustainability. Expanding Dutch engagement in Iraq's dairy industry could lead to a transformation in production practices, aligning with global trends in sustainability and efficiency.

The Dutch dairy sector has a worldwide very strong position, and has a long tradition of breeding cattle with very high production potential, highly skilled farmers that are capable to manage dairy farms with Holstein-Friesian cattle producing high quality milk at a low cost-price and low carbon footprint and a low water footprint. In addition, there is a very high level of animal health care, low AMR, and increasing recognition of the value of animal welfare as key component for modern dairy production. Yet, also the Netherlands is facing challenges such as climate change and soil degradation, for which currently the dairy sector is developing techniques to adapt to these challenges.

On the following areas links exist between the Dutch dairy sector (business sector, research organisations and knowledge centres/consultancies) and KRI and Iraq in technical assistance, training and education as well as delivery of supplies machinery and equipment.

Challenges and opportunities for the near future for Dutch companies is competition from Turkey and other countries that often offer lower prices for their supplies and equipment, yet at different quality levels. The Dutch companies often must compete based on higher quality of the products, which is a time-consuming approach. Often when lower quality products have failed, there is growing interest for better quality products. Thus, Dutch companies have more chances in a more advanced dairy sector, where quality of milk and cheese production and processing is a more dominating factor.

13. Conclusions

We conclude that there are favourable dairy development opportunities including job opportunities for men and women, mainly in KRI, for both cattle, sheep and goats. Cattle is most interesting due to higher production potential, and sheep and goat milk also offer opportunities. However, sheep milk may be too expensive for consumers, goat milk is cheaper. There is also potential for yoghurts and cheese products.

Main challenges are how to acquire land for feed production, and how to cope with the water shortage and how to improve the knowledge on modern high quality milk production techniques among farmers, extensions workers and veterinarians. Linked to this is the need to develop the business environment and technological infrastructure for an economically viable dairy supply chain, supported by a stable dairy development policy by the government. A challenge for the government is how to both pay tribute to smallholders that play a role at the local level, together with support for more industrial dairy production, that can play a role at the national level, and on the long term, international level.

Above all, ensuring a climate and environmentally smart dairy production will be a key approach for sustainable dairy sector.

Opportunities for Dutch Companies

The Kurdistan Region of Iraq (KRI) presents promising opportunities for Dutch companies in the dairy sector, driven by local demand, a favourable climate for agricultural expansion, and the region's growing interest in modern, sustainable farming practices (Netherlands Enterprise Agency, 2022). The following key areas align well with Dutch expertise and technology and could be impactful entry points for Dutch companies:

Trade in Livestock, Supplies, and Equipment

1. **High-Quality Cattle and Genetics**

Importing high-genetic-value cattle, particularly heifers and goats, and supporting artificial insemination (AI) services can improve milk yield and livestock health, which are critical to establishing a profitable dairy sector.

2. **Feed Production and Nutritional Premixes**

Dutch expertise in crop production and feed formulation can support local feed production, ensuring consistent, high-quality nutrition for livestock and reducing dependency on imported feed.

3. **Modern Farm Infrastructure**

Advanced farm infrastructure, such as durable farm buildings, optimized milk parlours, and mechanized facilities, can boost productivity and animal welfare, making them attractive to local dairy operations.

4. **Milking, Processing Equipment, and Maintenance**

High-quality milking and processing equipment, with a focus on proper maintenance training, aligns with

Iraq's demand for efficient and sanitary dairy production technology, particularly in semi-hard cheese and milk-cooling technologies.

5. **Water-Saving Techniques and Systems**

Given the critical water scarcity, Dutch companies can introduce water-efficient (i.e. water-smart) practices across feed production, dairy husbandry, and processing stages. Techniques such as optimized irrigation, water recycling, and efficient feed and forage systems are key in drought-prone areas.

6. **Veterinary Services and Prudent Use of Antibiotics**

Expertise in veterinary services and responsible antibiotic use can help the Iraqi dairy sector improve animal health outcomes while managing antimicrobial resistance.

7. **Extension and Advisory Services**

Dutch extension services and training systems can strengthen local knowledge of good farming practices, building capacity in dairy production, animal welfare, and dairy-specific agronomy.

Consultancy and Training Services

1. **Improving Dairy Quality through Training and Capacity Building**

Training services that cover essential areas such as nutrition, husbandry, and prudent use of veterinary drugs are crucial for the transition from smallholder to commercial dairy farms. Dutch companies can play a significant role in offering technical assistance and training, aligned with best practices in dairy production.

2. **Water-Efficient Dairy Practices**

Consultancy on water-efficient techniques—particularly in feed production, animal husbandry, and dairy processing—aligns with KRI's need to conserve scarce water resources and adapt to climate conditions.

3. **Extension Services Development (Train-the-Trainer Programs)⁵¹**

By strengthening local extension services, Dutch companies can build in-country expertise that empowers local trainers to disseminate advanced dairy practices, creating sustainable improvements across the sector.

4. **Organizational Support for Dairy Cooperatives**

Improved organization of dairy cooperatives or farmers' organizations can help Iraq develop a more resilient dairy supply chain, stabilize milk prices, and enhance bargaining power for local farmers.

Partnerships and Impact Clusters

1. Dutch companies may also explore partnership models that facilitate sustainable, long-term development in Iraq's dairy industry, such as the Netherlands Enterprise Agency's IMPACT clusters, which foster collaborations between Dutch and local stakeholders. By working with local farmers, governments, and NGOs, Dutch companies can establish impact-driven projects that align with Iraq's environmental and economic goals.

⁵¹ <https://www.iraq-businessnews.com/2023/09/16/transforming-the-dairy-sector-in-ninewa-iraq/>

14. Recommendations for Dutch Companies

Dutch companies interested in the market in Iraq are encouraged to enter the market because there are many opportunities. However, it is recommended not to introduce conventional intensive dairy production farms as sole solution in Iraq as this may seem economically interesting for the short term but will not be sustainable on the long term. Introduction of modern high-tech climate- and environmentally smart techniques in dairy production is more likely to offer competitive advantages and can lay the foundation for long-lasting business relations with the different stakeholders in Iraq and the KRI: farmers, supply chain, industry, as well as government representatives.

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